FIG. 1

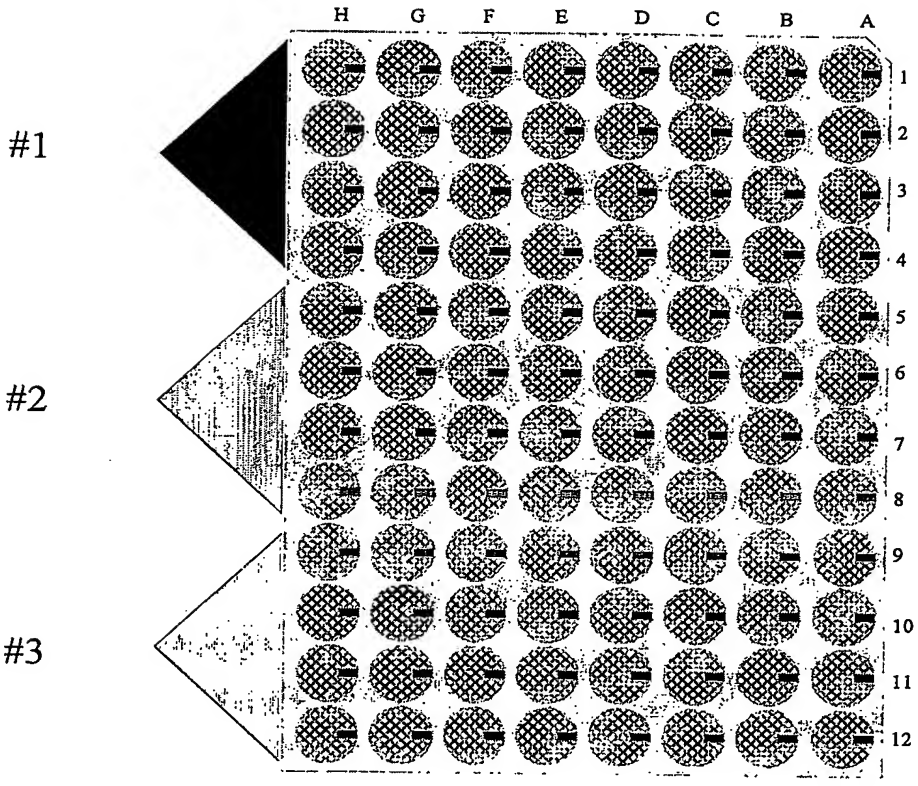


FIG. 2

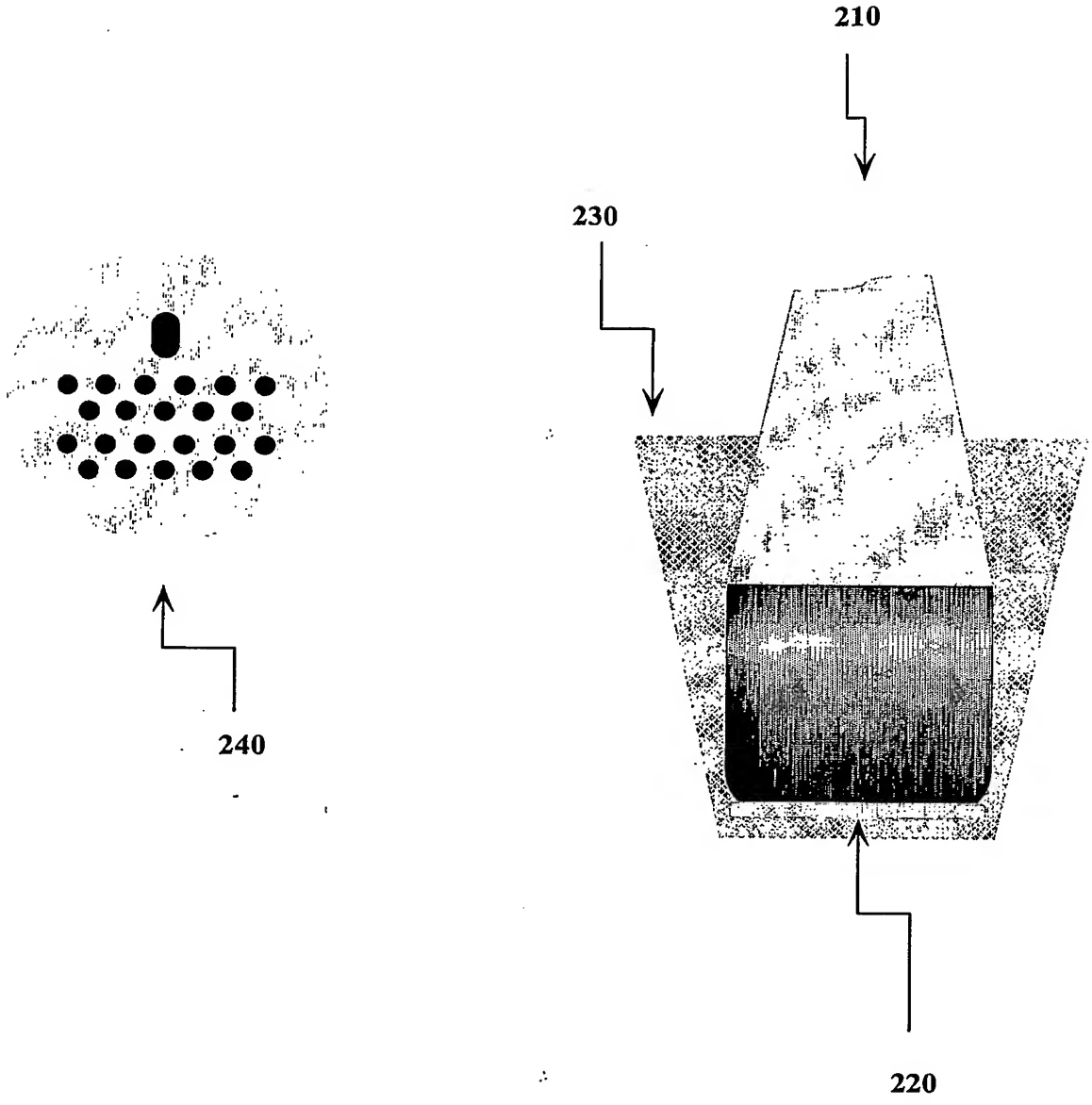
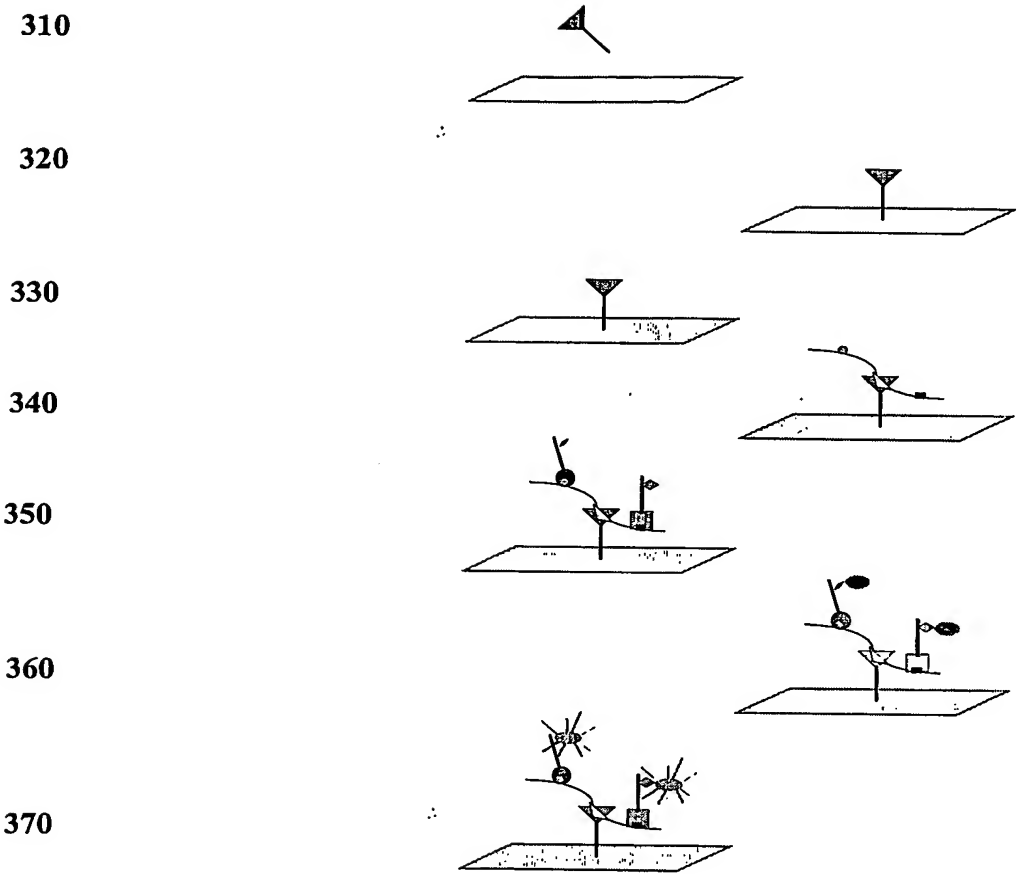
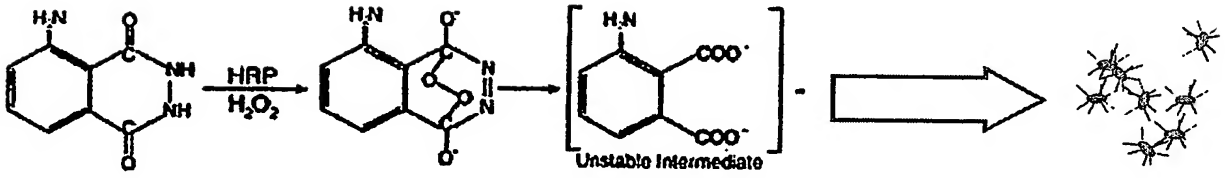


FIG. 3





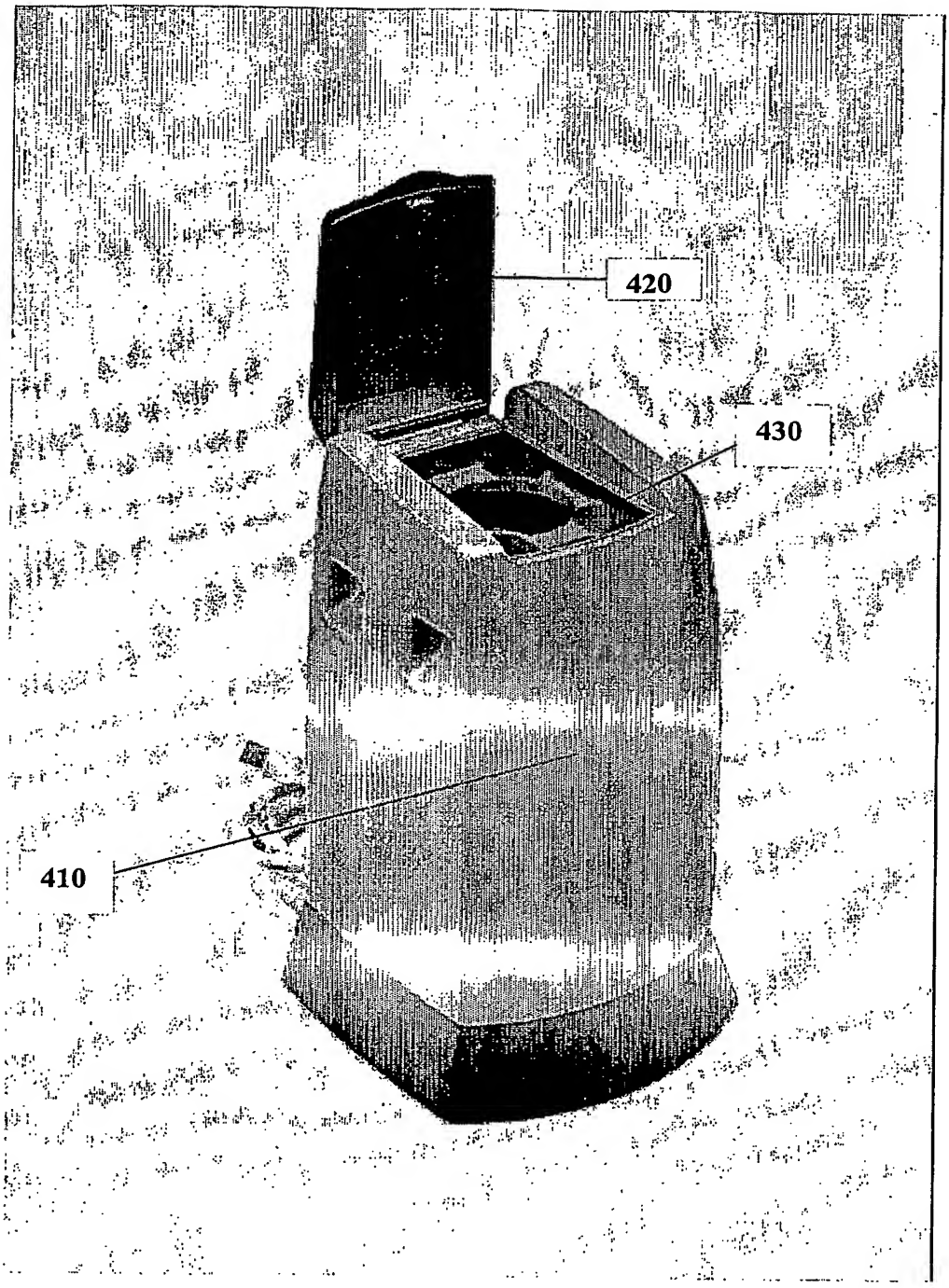


FIG. 4

FIG. 5

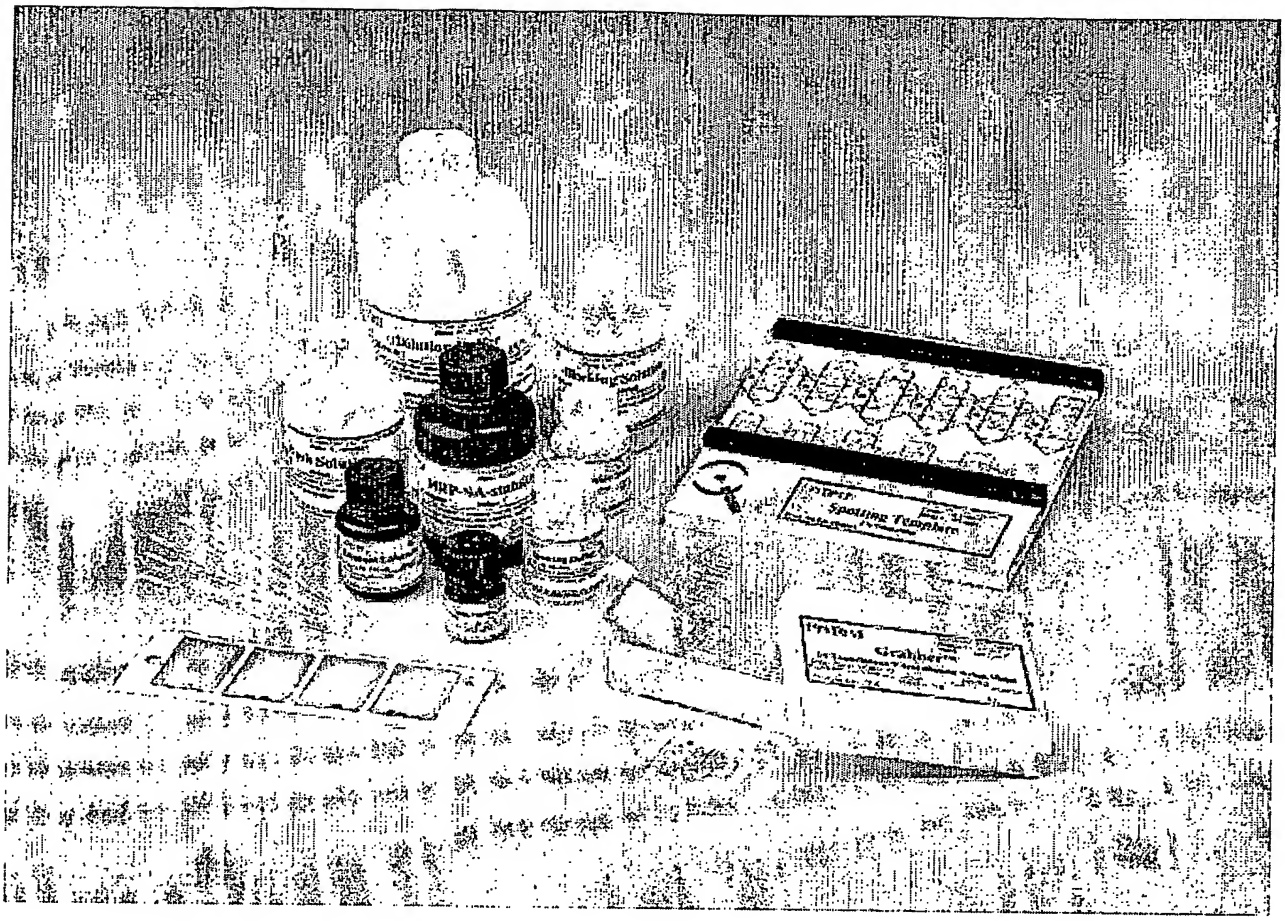


FIG. 6

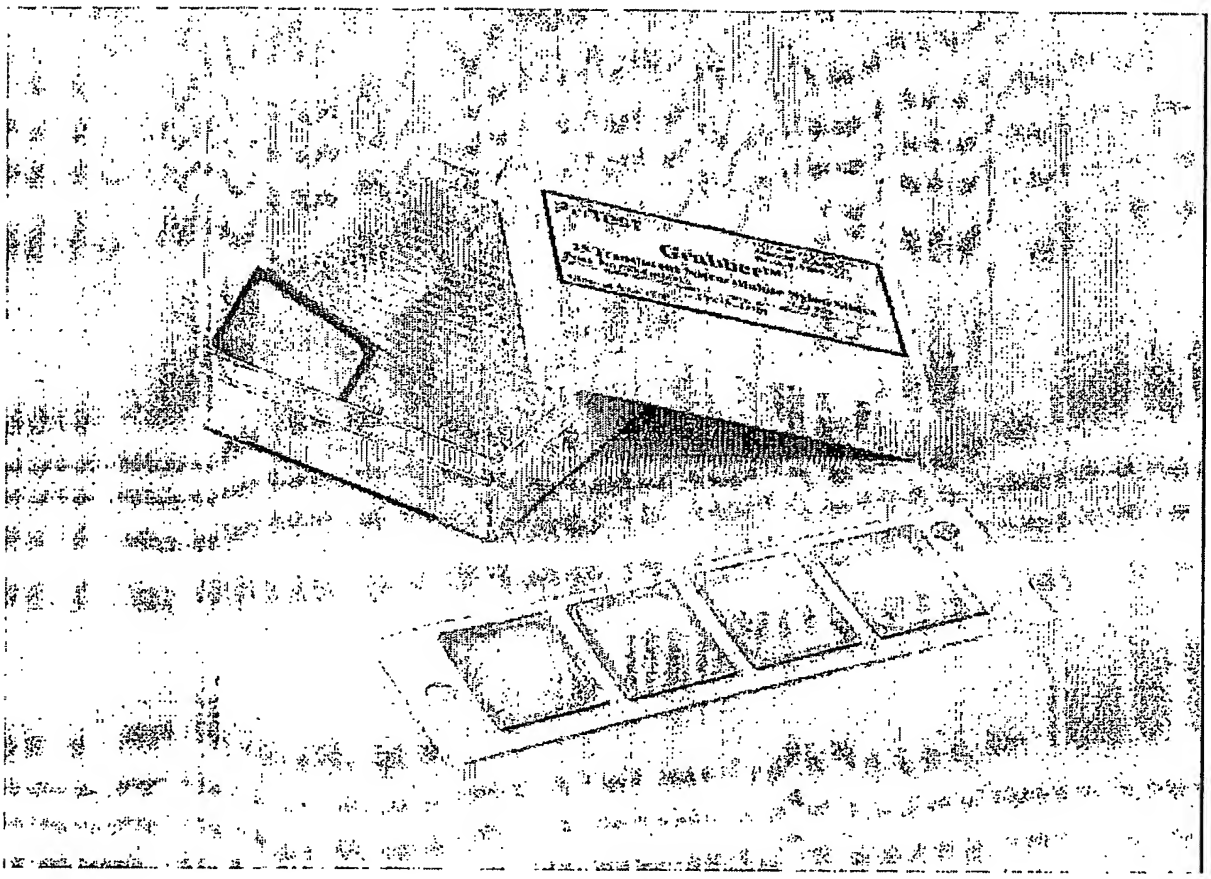


FIG. 7

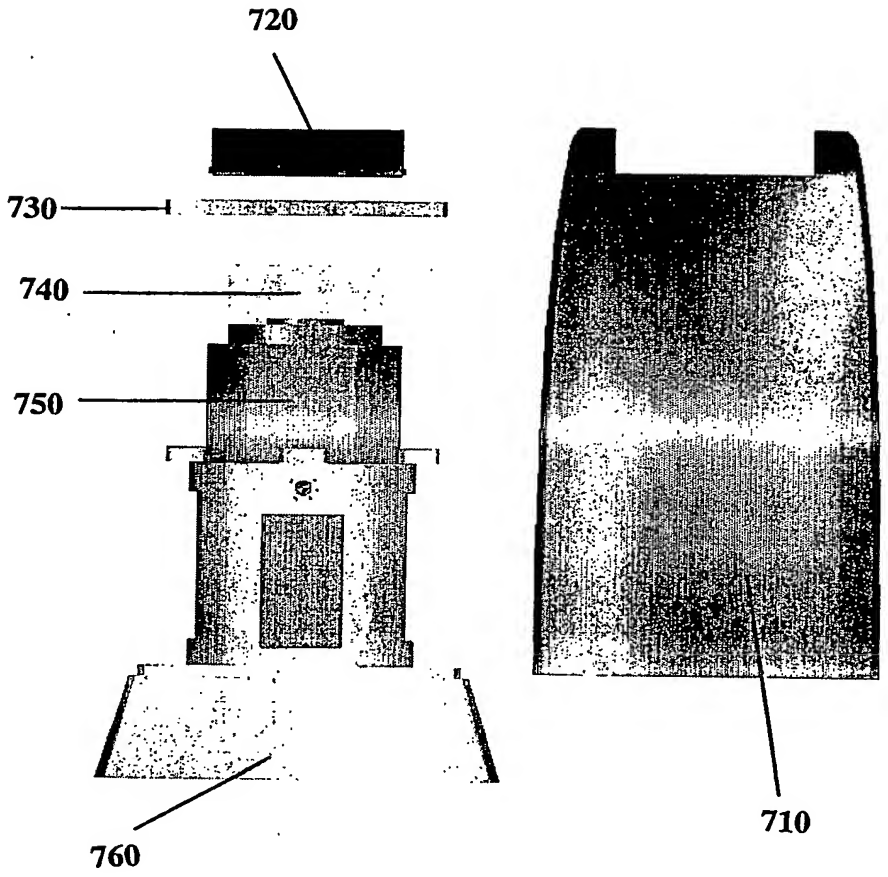


FIG. 8

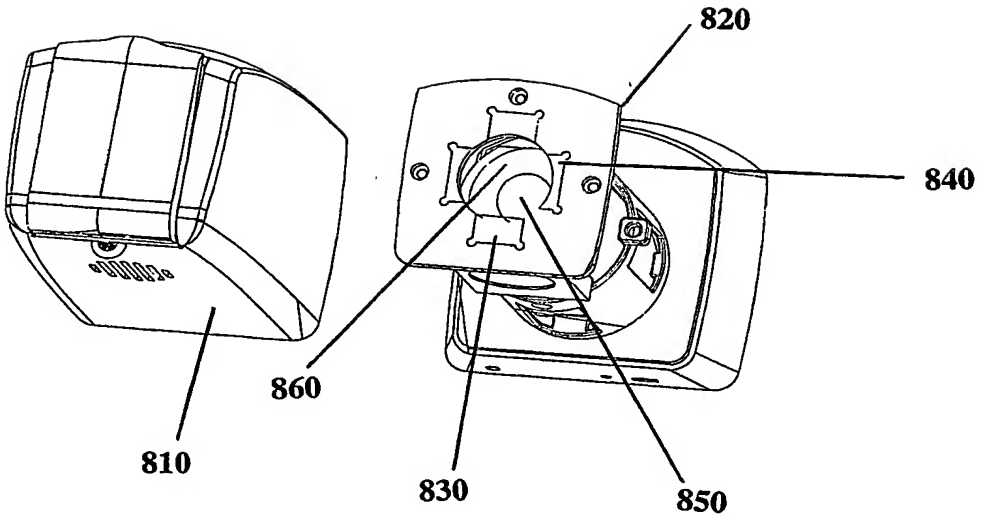
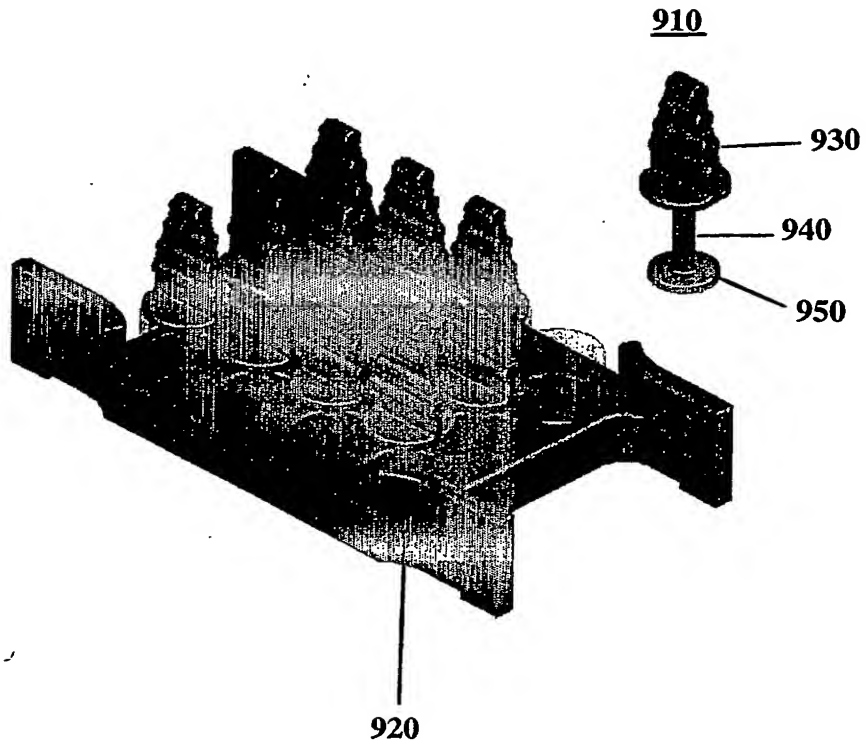


FIG. 9



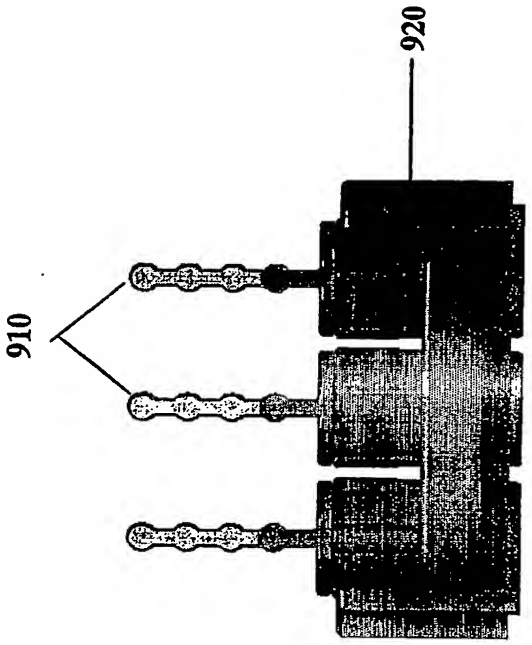
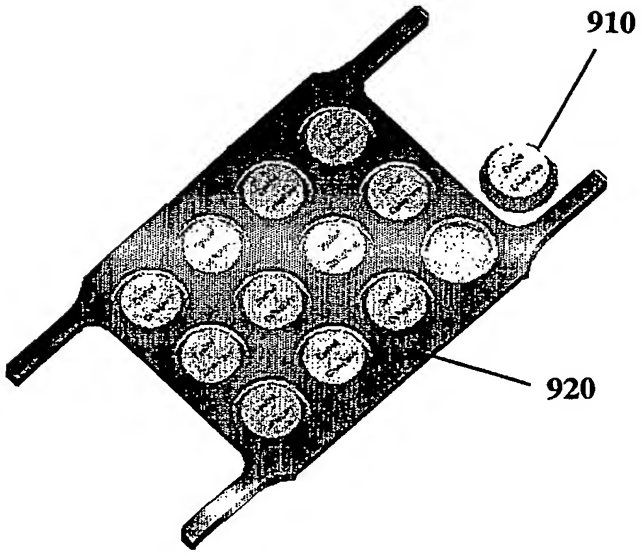


FIG. 10

FIG. 11



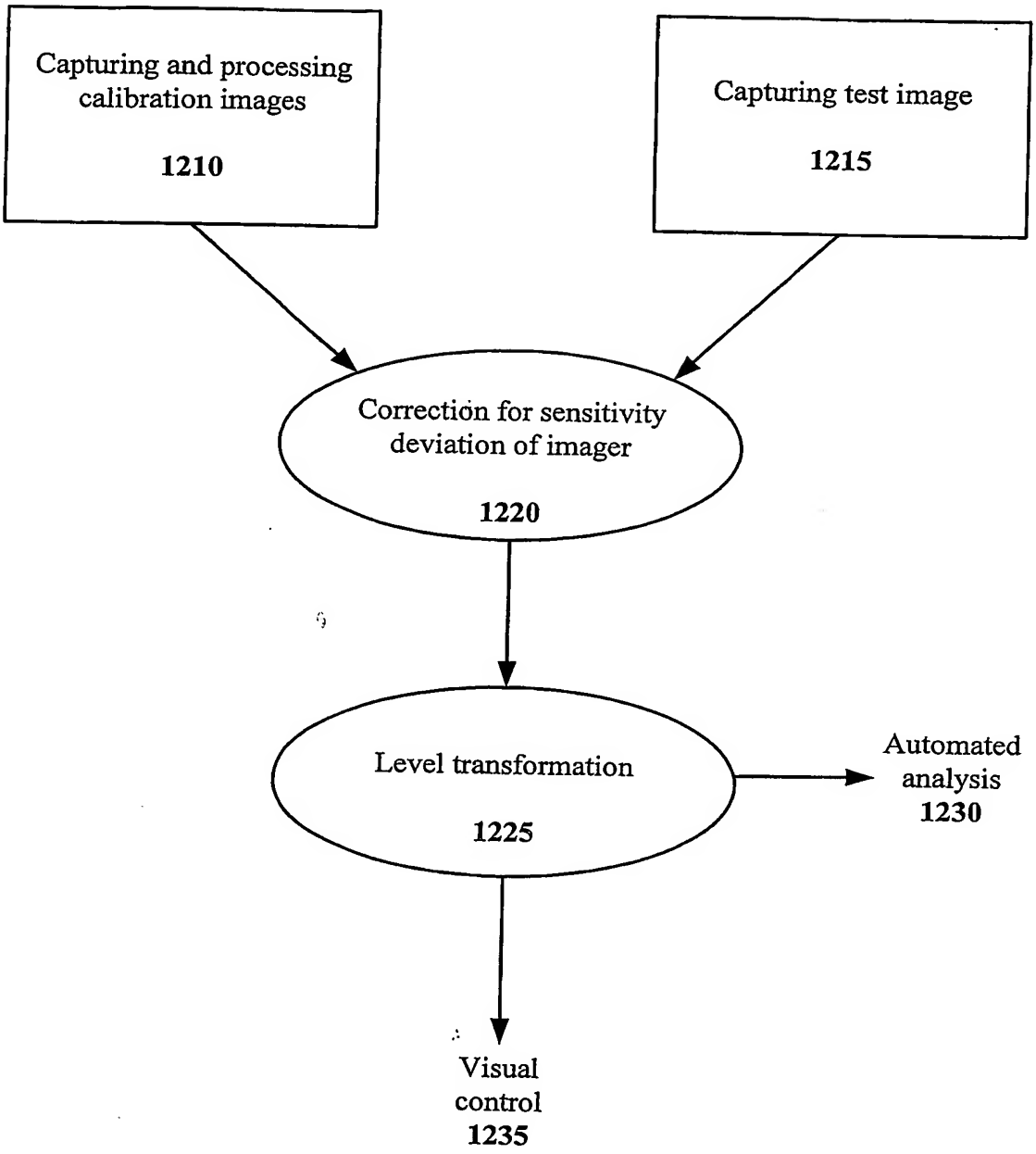

Capturing and processing calibration images
1210
Capturing test image
1215
Correction for sensitivity deviation of imager
1220
Level transformation
1225
Automated analysis
1230
Visual control
1235

Figure 12

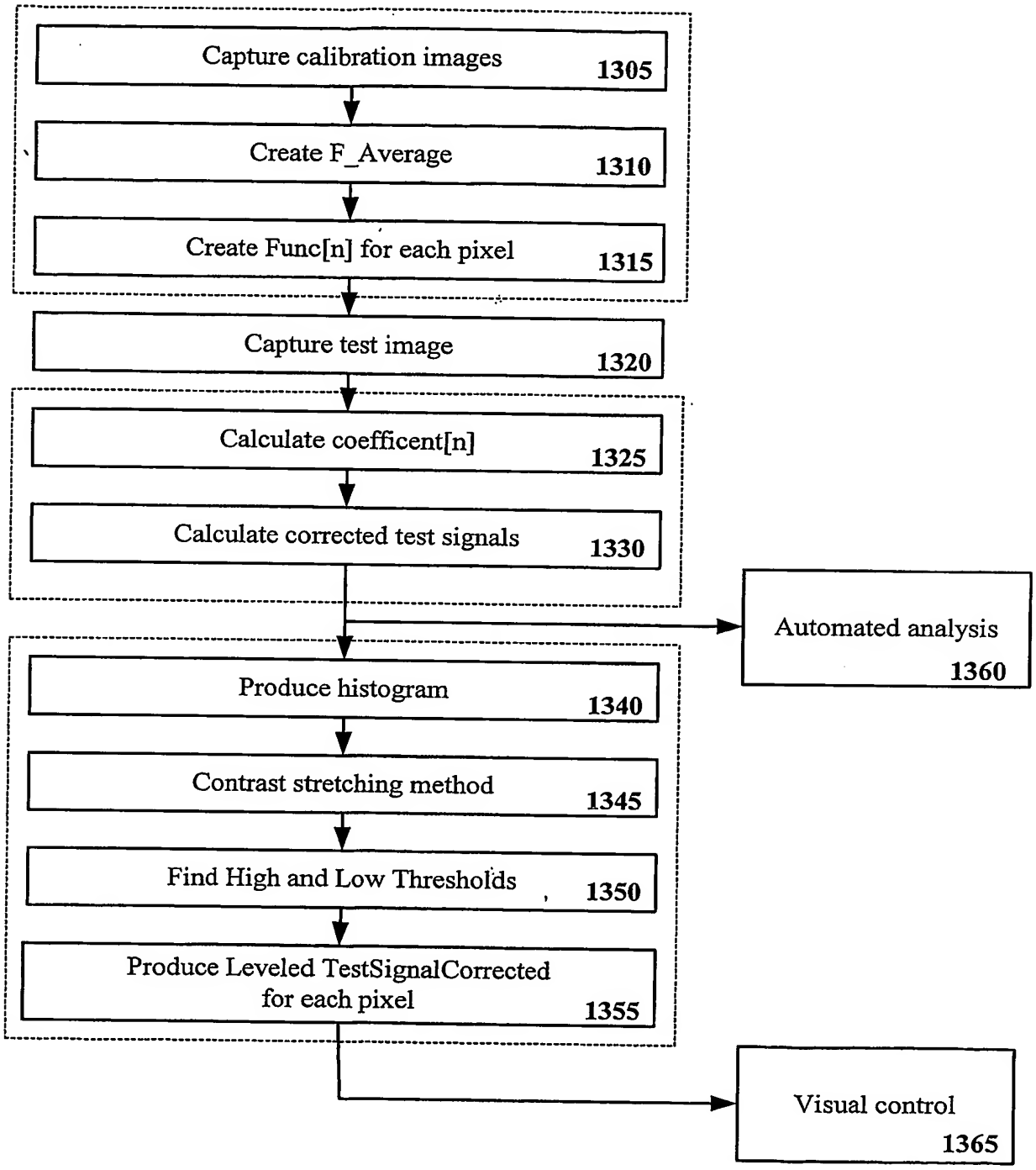

Capture calibration images
1305
Create F_Average
1310
Create Func[n] for each pixel
1315
Capture test image
1320
Calculate coefficent[n]
1325
Calculate corrected test signals
1330
Automated analysis
1360
Produce histogram
1340
Contrast stretching method
1345
Find High and Low Thresholds
1350
Produce Leveled TestSignalCorrected for each pixel
1355
Visual control
1365

Figure 13

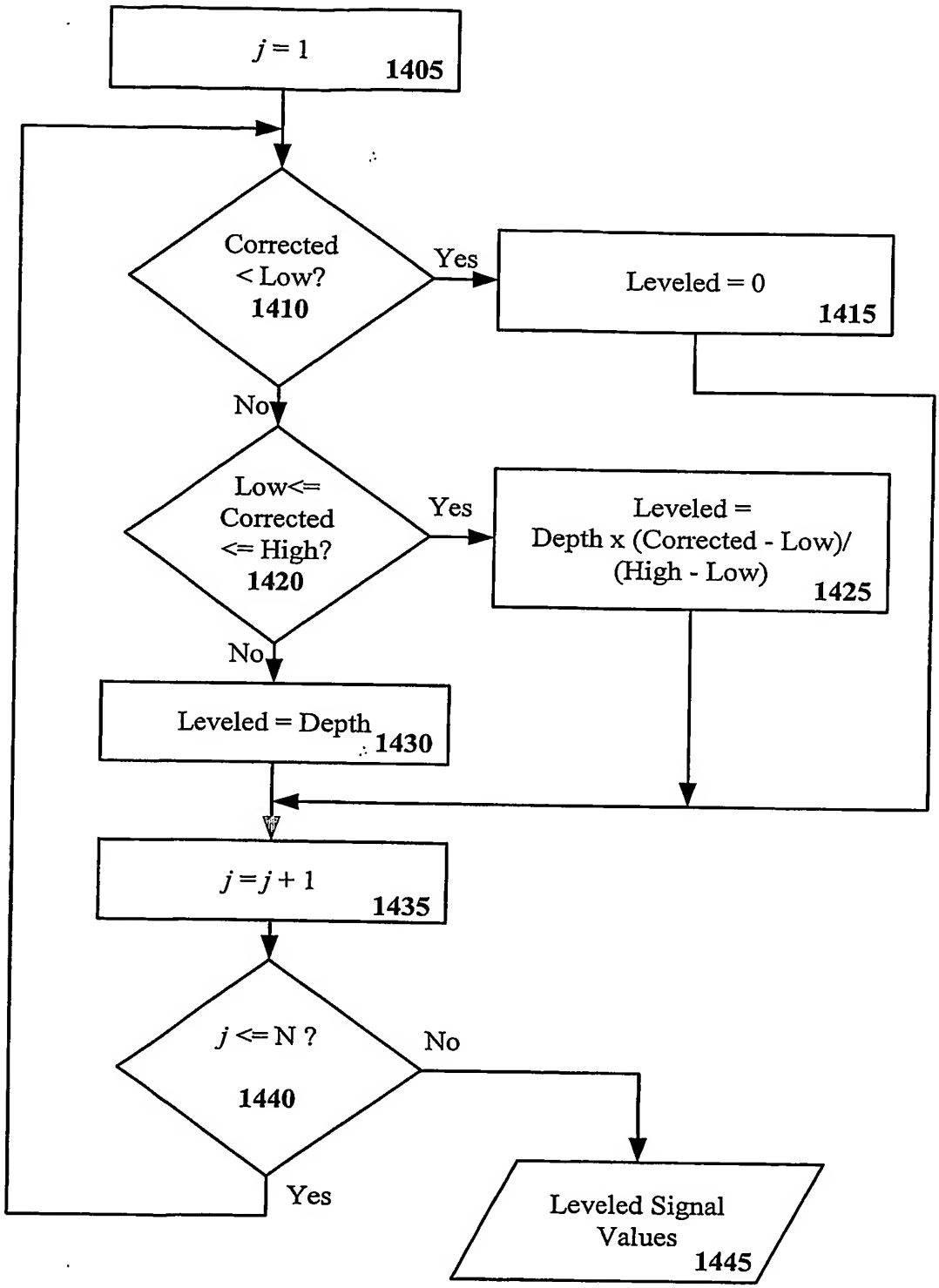

j = 1
1405
Corrected < Low?
1410
Yes
Leveled = 0
1415
No
Low<= Corrected <= High?
1420
Yes
Leveled = Depth x (Corrected - Low)/ (High - Low)
1425
No
Leveled = Depth
1430
j = j + 1
1435
j <= N ?
1440
No
Yes
Leveled Signal Values
1445

Figure 14

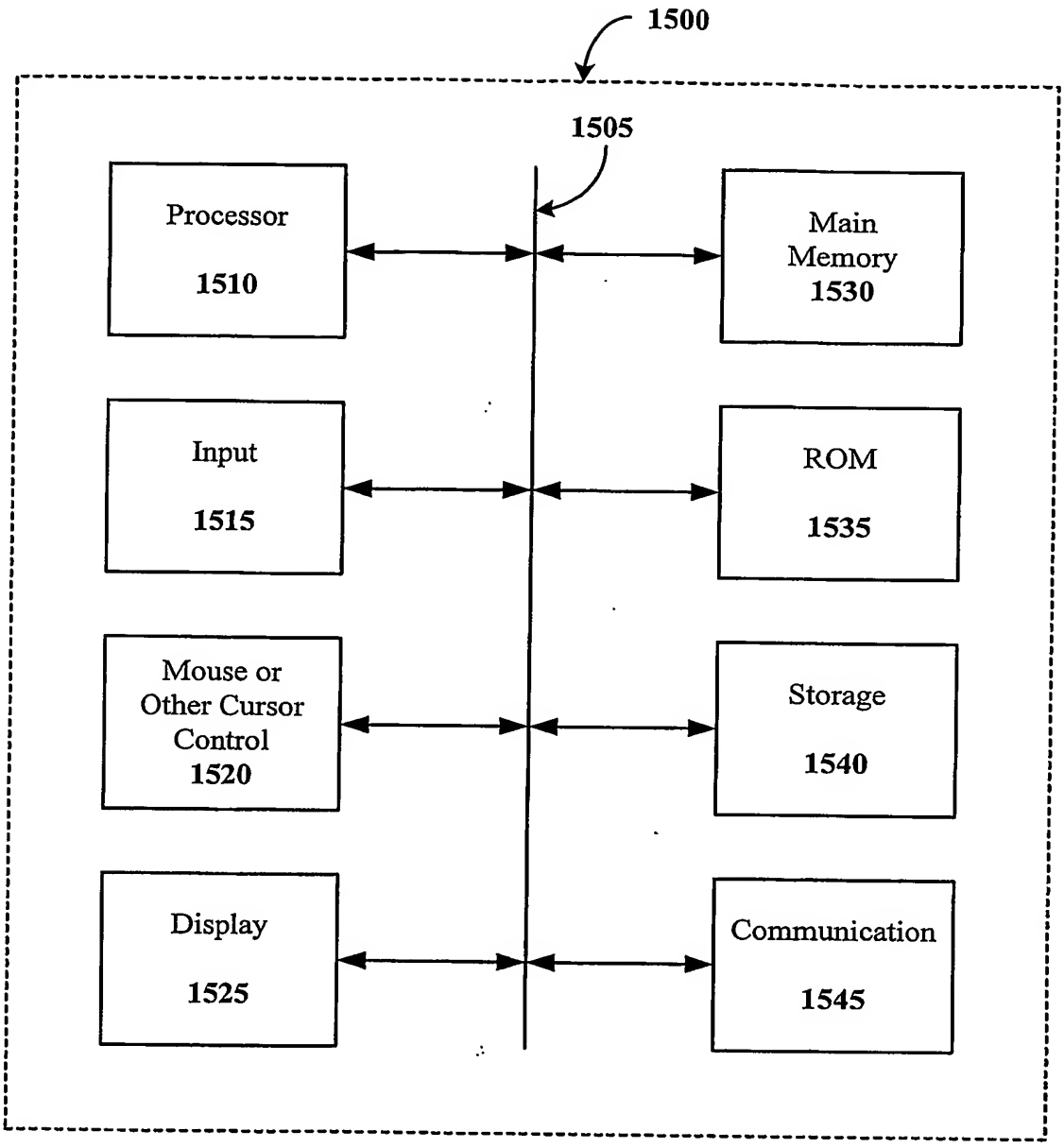

1500
1505
Processor
1510
Main
Memory
1530
Input
1515
ROM
1535
Mouse or
Other Cursor
Control
1520
Storage
1540
Display
1525
Communication
1545

Figure 15

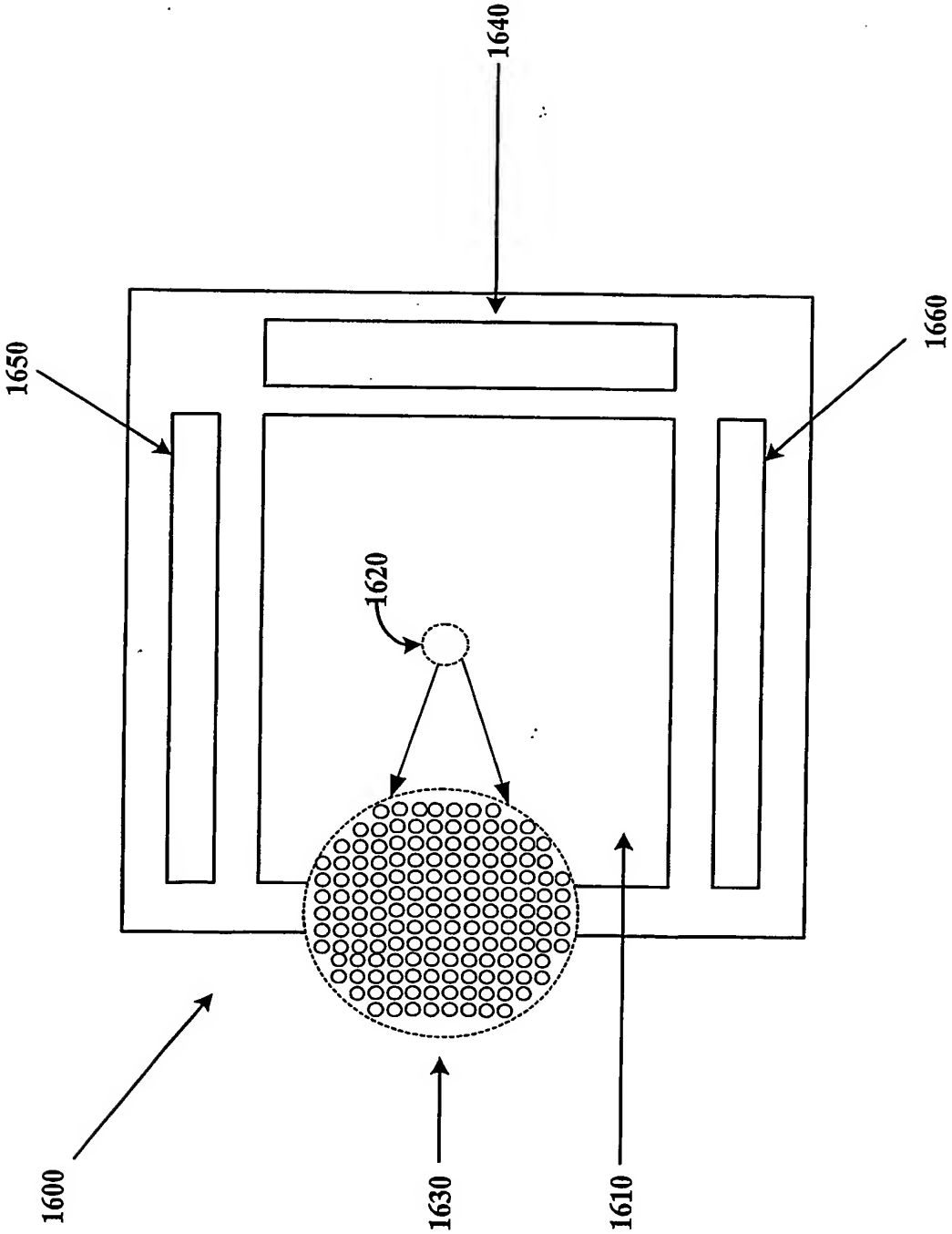


Figure 16

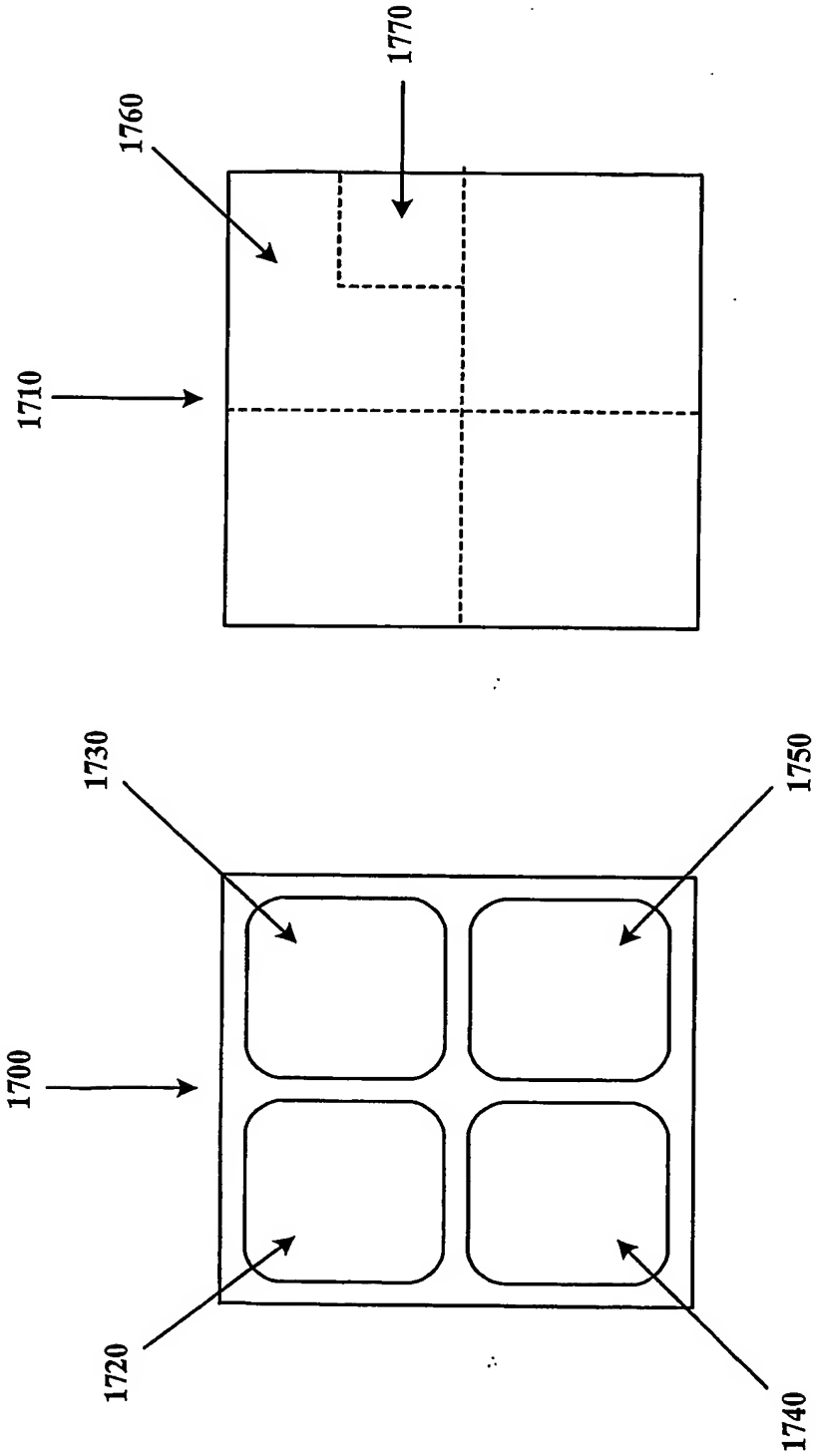
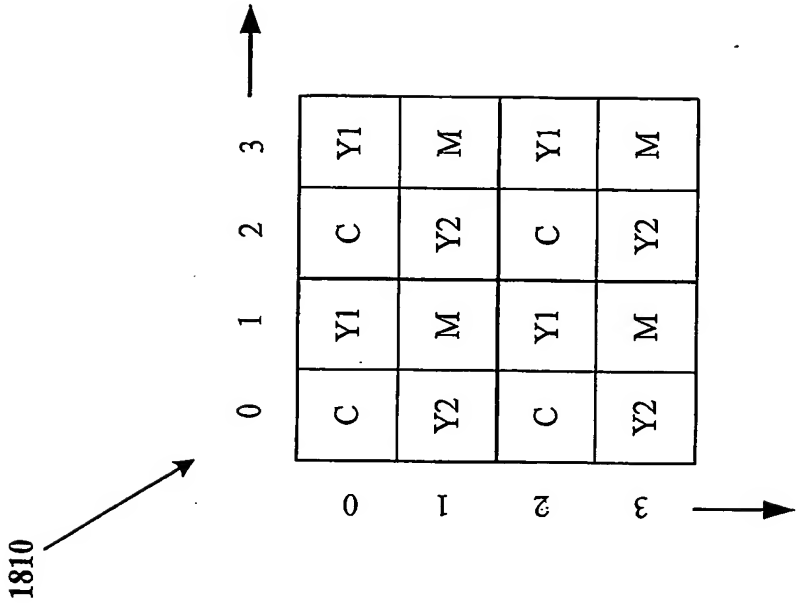


Figure 17



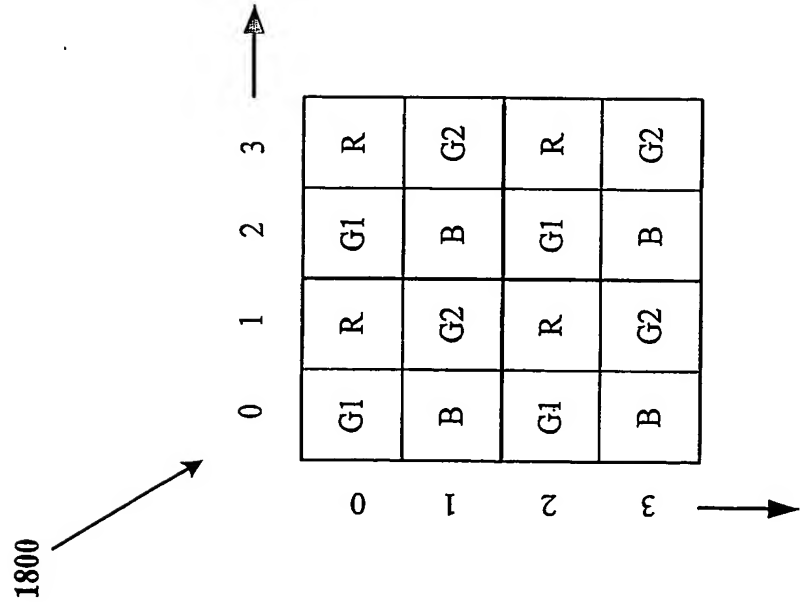


Figure 18

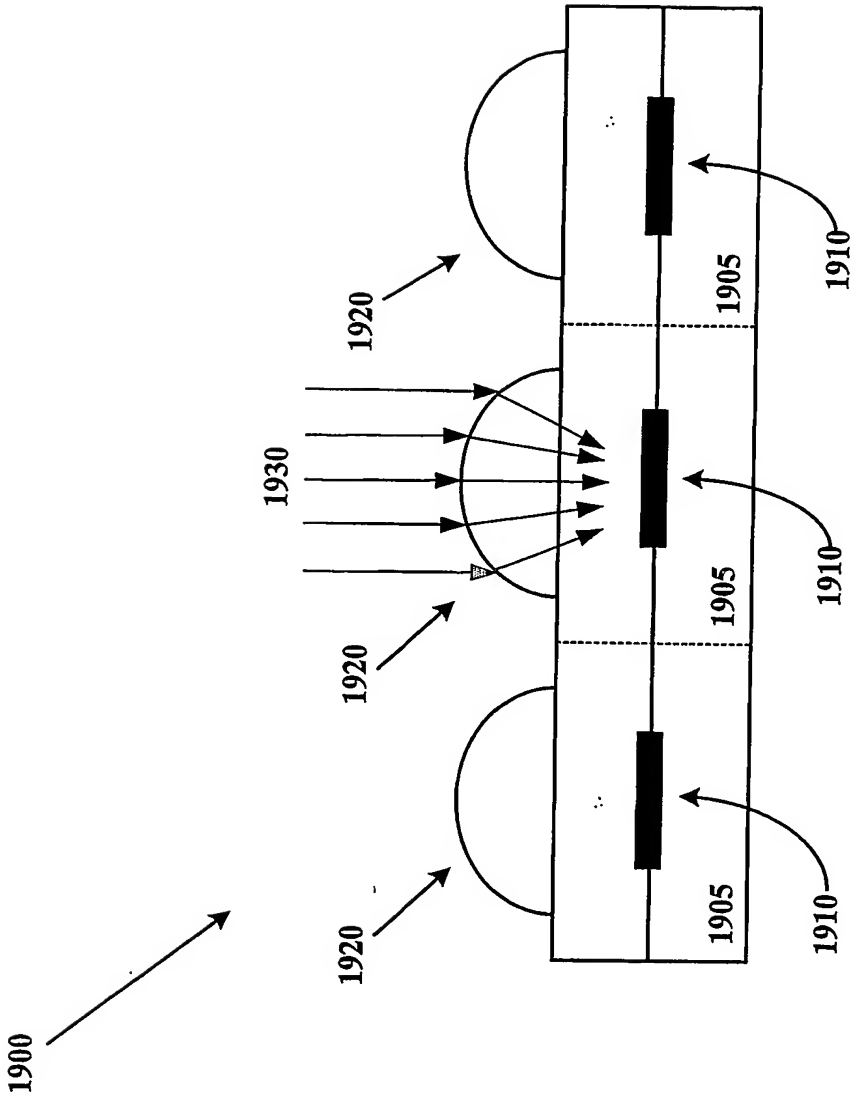


Figure 19

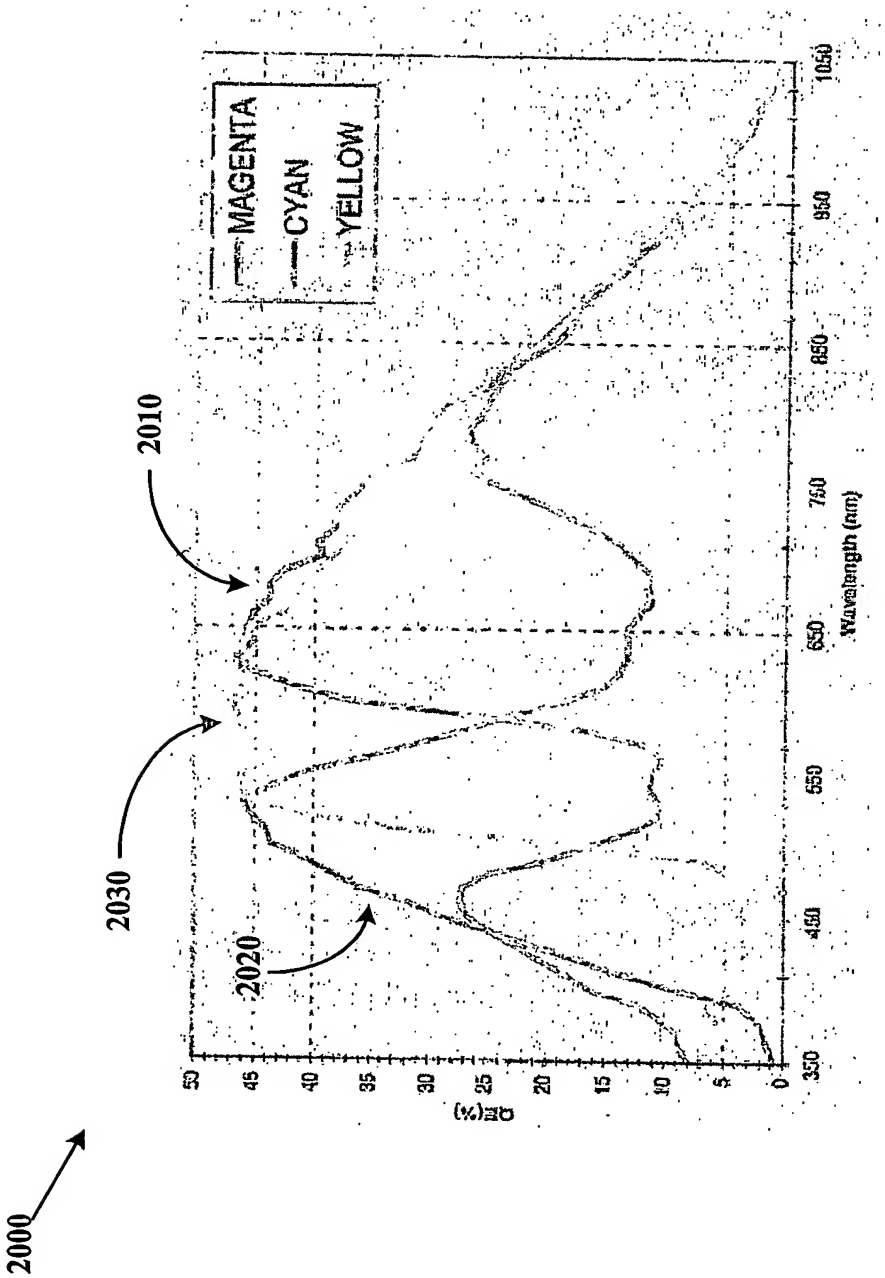

2000
2010
2020
2030
MAGENTA
CYAN
YELLOW
RR(%)
Wavelength (nm)
0
5
10
15
20
25
30
35
40
45
50
350
450
550
650
750
850
950
1050

Figure 20

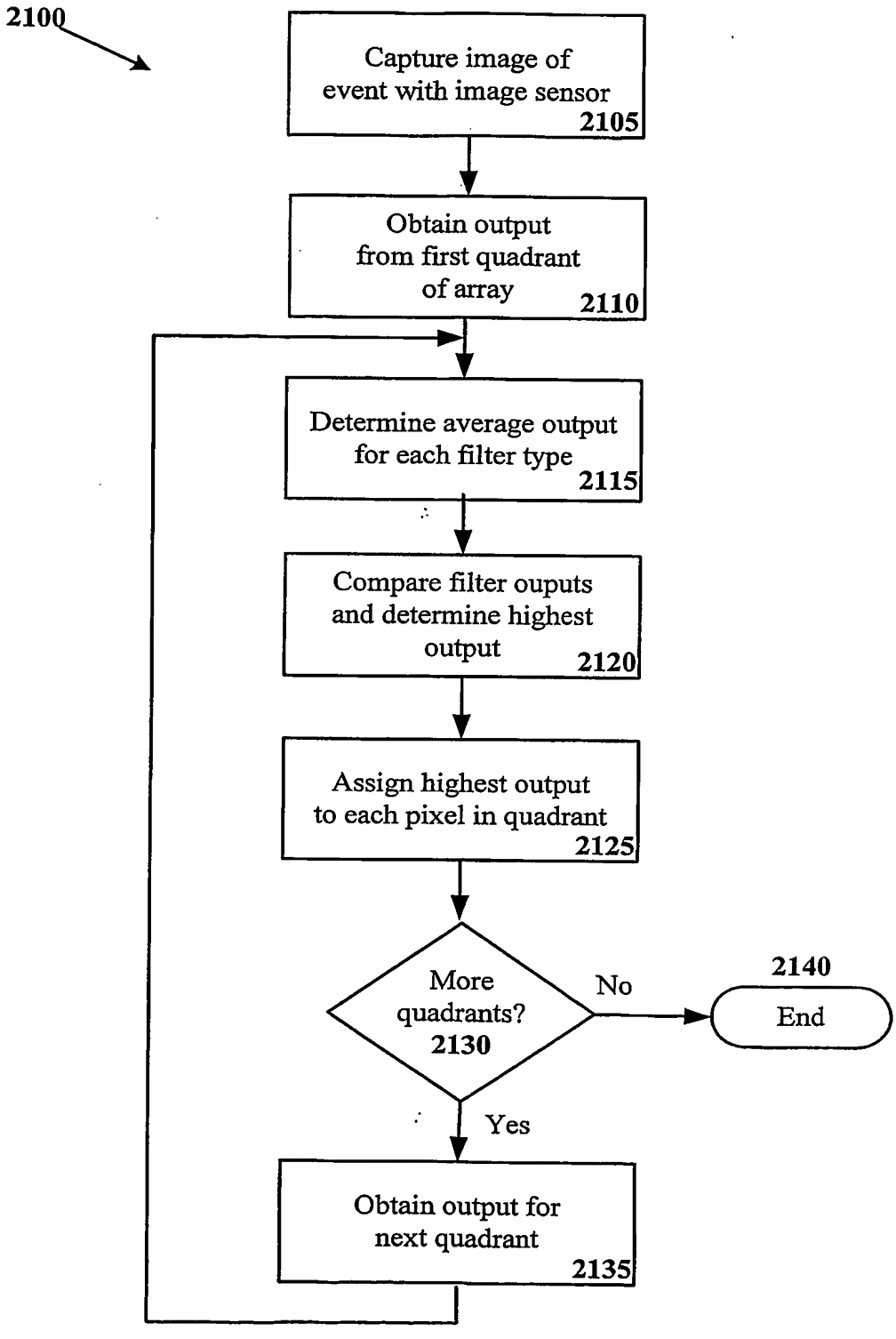

2100
Capture image of event with image sensor
2105
Obtain output from first quadrant of array
2110
Determine average output for each filter type
2115
Compare filter ouputs and determine highest output
2120
Assign highest output to each pixel in quadrant
2125
More quadrants?
2130
No
2140
End
Yes
Obtain output for next quadrant
2135

Figure 21

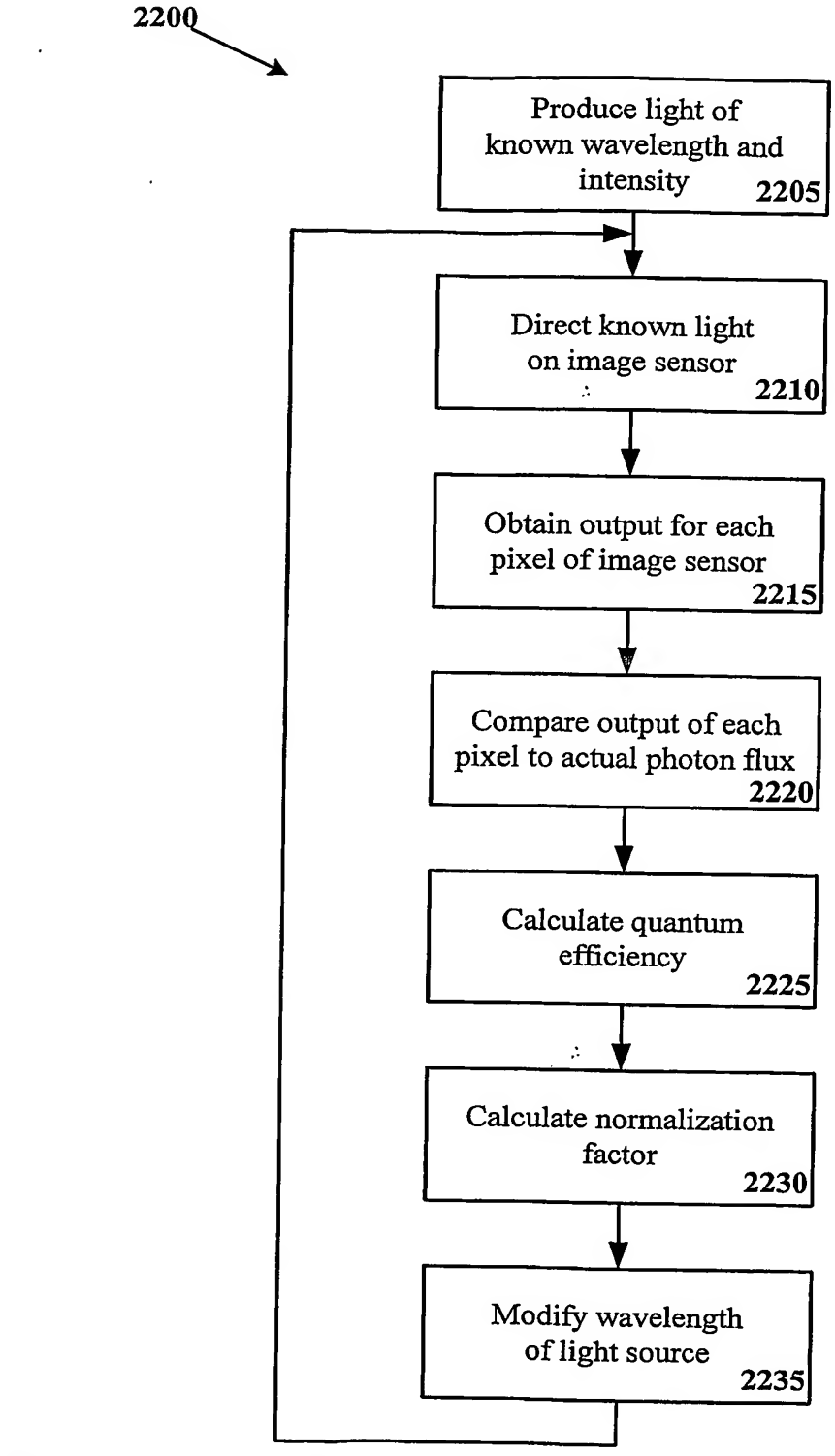

2200
Produce light of known wavelength and intensity 2205
Direct known light on image sensor 2210
Obtain output for each pixel of image sensor 2215
Compare output of each pixel to actual photon flux 2220
Calculate quantum efficiency 2225
Calculate normalization factor 2230
Modify wavelength of light source 2235

Figure 22

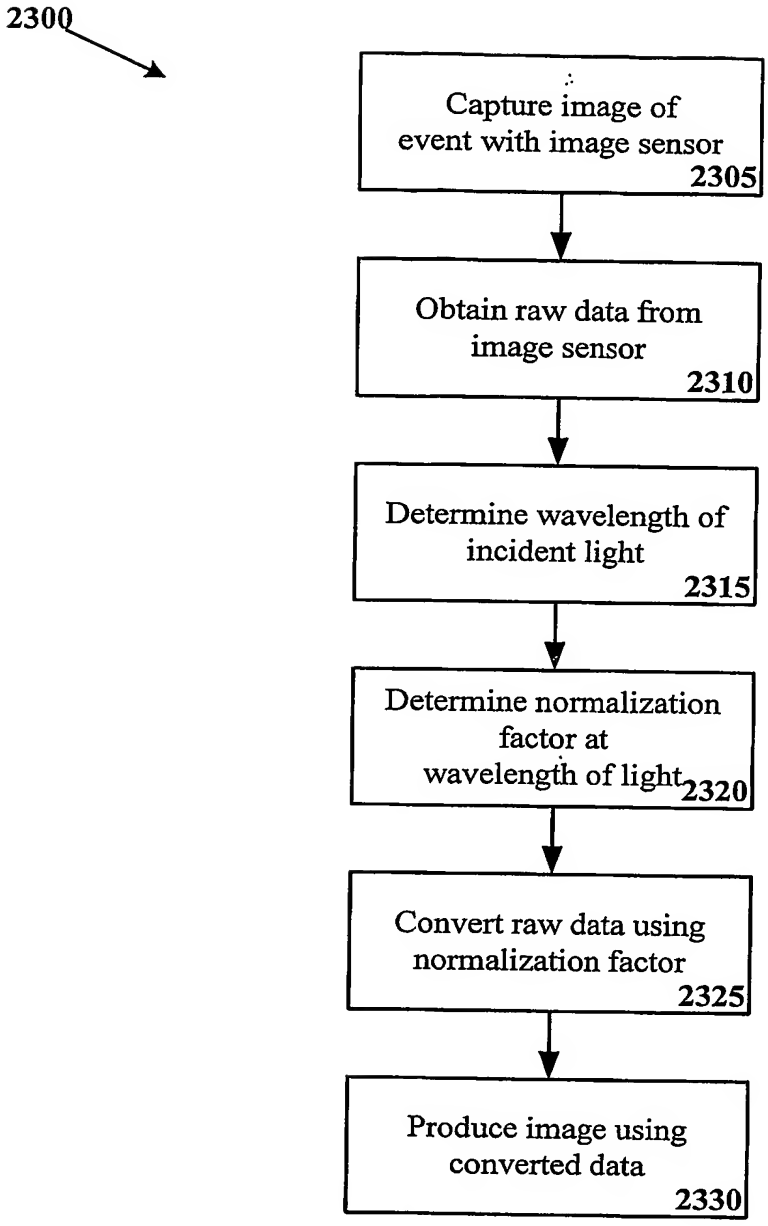

2300
Capture image of event with image sensor
2305
Obtain raw data from image sensor
2310
Determine wavelength of incident light
2315
Determine normalization factor at wavelength of light
2320
Convert raw data using normalization factor
2325
Produce image using converted data
2330

Figure 23

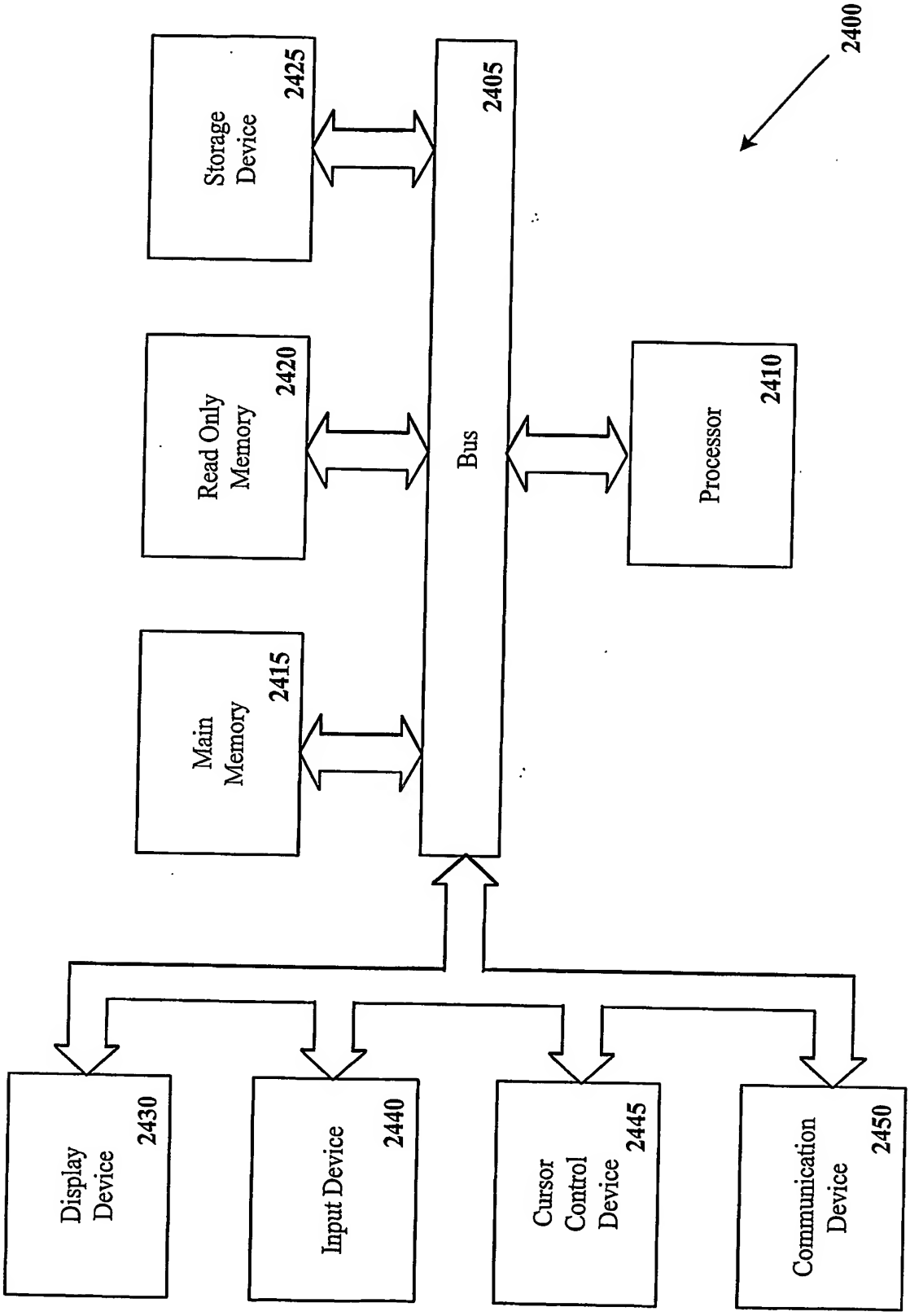
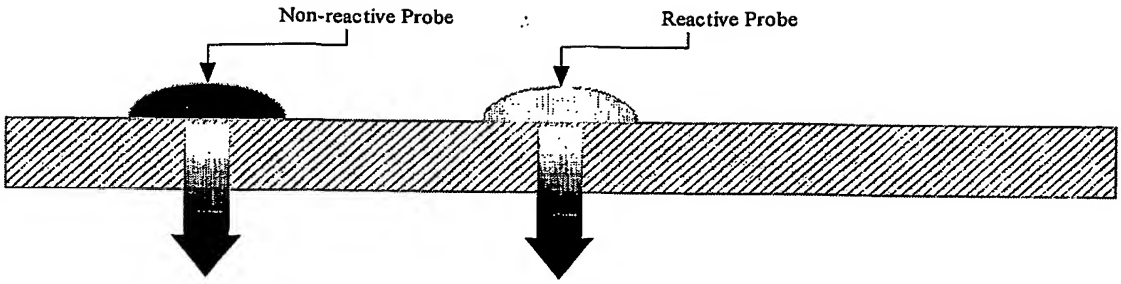
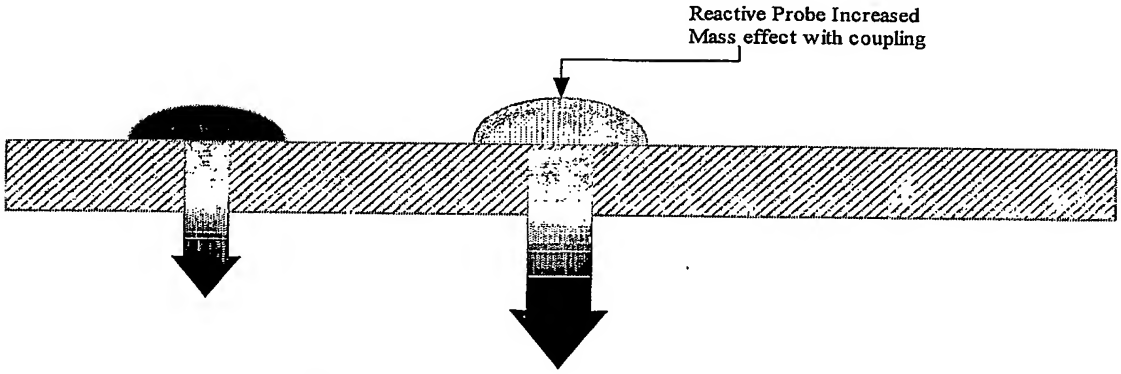

2400
Storage Device
2425
Bus
2405
Read Only Memory
2420
Processor
2410
Main Memory
2415
Display Device
2430
Input Device
2440
Cursor Control Device
2445
Communication Device
2450

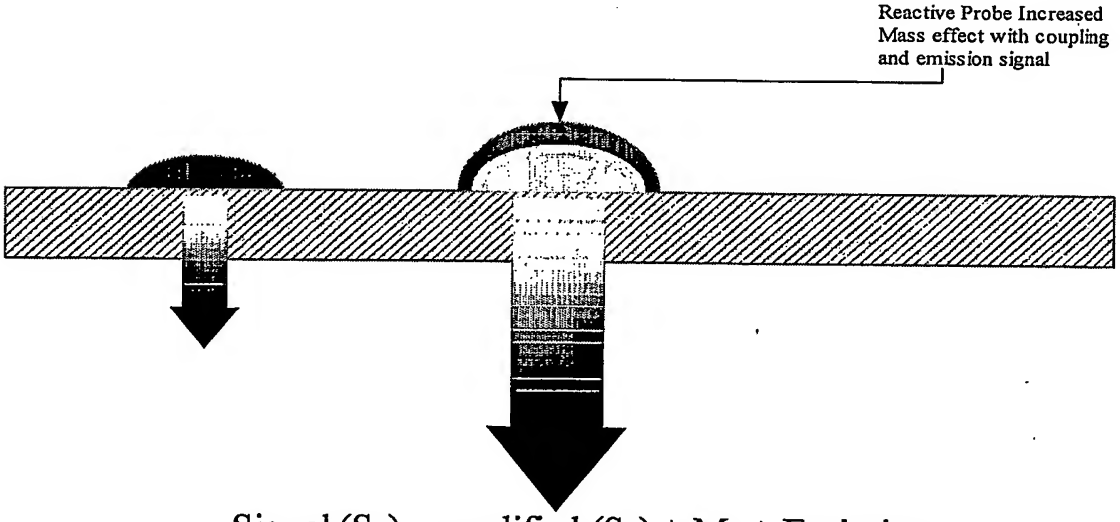
Figure 24



Signal (S_{ref}) = Primary Scatter (S_p)



Signal (S_2) = modified (S_p) + M_2



Signal (S_3) = modified (S_2) + M_3 + Emission

Figure 25